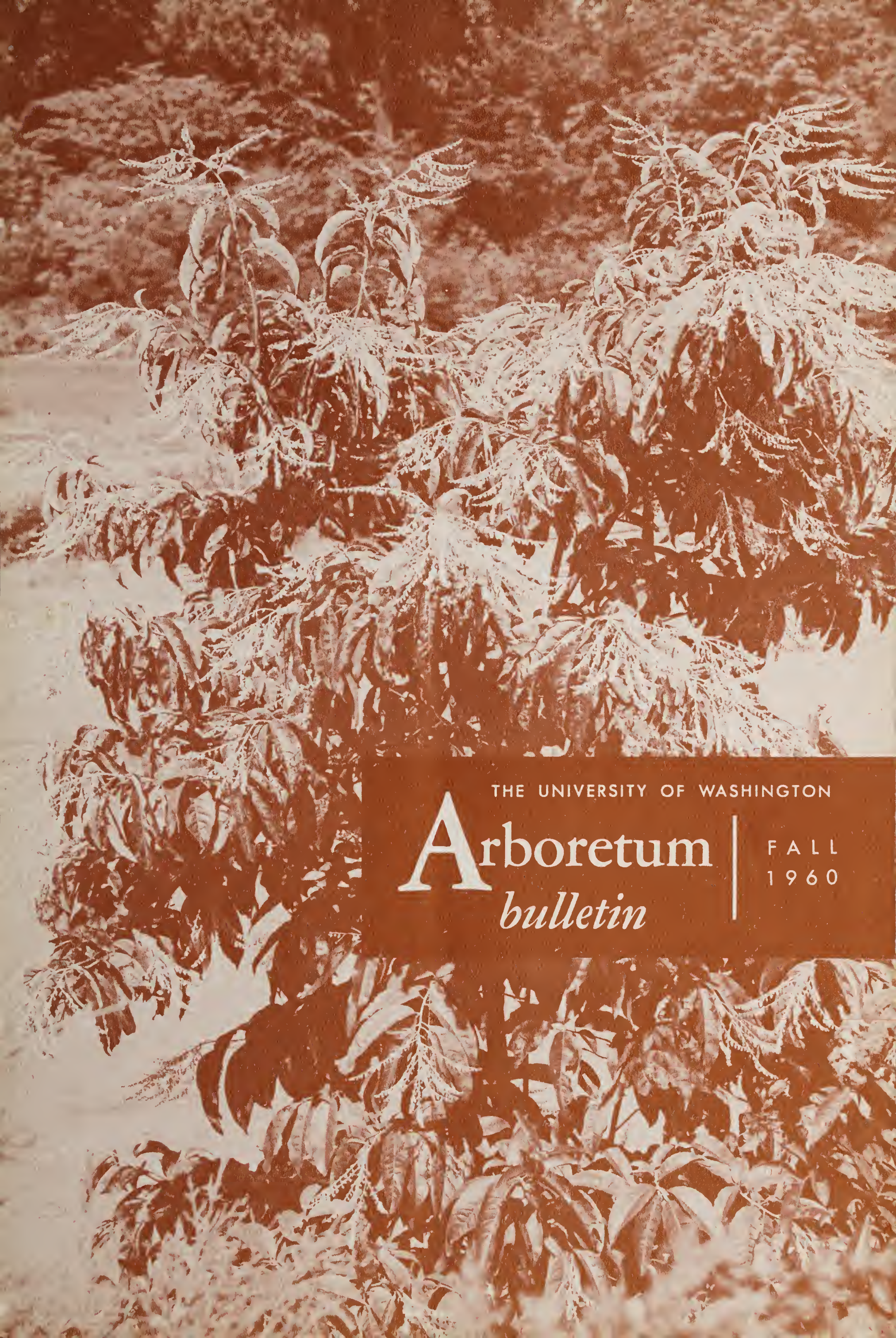

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Arboretum *bulletin*

FALL 1960

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COVER: *Oxydendrum arboreum*
PHOTO BY: WILLIAM ENG

Here's to the Future!

The keenest enjoyment of celebrating any anniversary stems from the prospects envisioned ahead. This year of celebrating the 25th anniversary of the University of Washington Arboretum draws to a close, so far as THE BULLETIN *is concerned, with this issue. All eyes are now fixed on the future. We hope to bring horticultural information from an ever widening circle of amateur and professional writers and to include special features which will, as have others in the past, become indispensable sources of information for the readers.*

THE EDITORIAL BOARD

ERICACEAE

The Heaths and Heathers

IT is a known fact that, with proper selection, one can have heather in bloom all year round.

For those not acquainted with these plants, it might be well to tell of the generic differences that characterize the different types. The word "heather" is the name commonly given to all forms of *Bruckenthalia, Calluna, Erica, Daboecia, Phyllodoce* and *Cassiope.* To be specific, the "heather" is only one genus, the *Calluna,* which has one species, *vulgaris,* but many varieties. Other names for *Calluna vulgaris* are the "Ling" as in England, or the "Scotch Heather" of Scotland. It is distinguished by scale-like leaves which are opposite and form four rows on the stem. The flowers are single, about two or three millimeters long, or double, as in the newer varieties. They are produced in mass profusion on long slender spikes. The *Erica,* which is the true "Heath," is the other important genus and contains over four hundred named species and varieties, of which only 15 or 20 may be grown out of doors here. This genus is distinguishable by the needle-like leaves which generally vary from three to five per whorl. The flowers are larger than those of *Calluna* and in the hardy species and many South African ones, the corolla is larger than the calyx, a feature which is reversed in the case of the *Calluna.* The flowers of the *Erica* usually appear in umbels, racemes or pseudo-spikes and develop in abundance on the plants. The *Bruckenthalia* has just one species, *B. spiculifolia,* which has pink flowers and blooms in the spring. The *Daboecia,* sometimes called the "Irish Heath," is quite common in the Northwest, though not so important. Of its three species, the most beautiful is the *D. Azorica,* a very outstanding plant *Cassiope* and Phyllodoce, the heather of our mountains, are of no significant value except in a collector's garden.

ARTHUR P. DOME

(March 1942)

Heather for the Pacific Northwest

CERTAIN heathers—*Erica, Bruckenthalia, Calluna, Daboecia* and *Phyllodoce*—are among the most satisfactory of the evergreen shrubs for planting in our Pacific Northwest. They are perfectly at home in our lighter, slightly acid soil, provided the land is well drained during our damp seasons but can be generously watered during the dry summer months. For good culture, a generous quantity of Canadian peat should be incorporated into the soil.

By proper selection of species and varieties they are unexcelled for year-round bloom and are very satisfactory for foreground planting in small groupings in front of rhododendrons or conifers. When used in solid masses in the rockery or for clothing banks, heathers are equally interesting. The taller-growing kinds can be used for accent planting in rockeries or for foundation plantings, preferably on an eastern exposure.

Most heathers of Western or Southern

European origin, with few exceptions, are perfectly hardy in the Pacific Northwest. Ericas of South African origin, on the other hand, are not hardy here but thrive in California.

Possibly the most widely represented in Northwest gardens is the genus *Erica*. There are several available species and horticultural varieties, all bearing small needle-like leaves without bracts. Here are some notes I have compiled, particularly as to color, flowering time and ultimate height:

Erica arborea, the tree heather, known to grow to a height of 10 feet or more. A native of the Mediterranean. Flowers are white, fragrant and carried in large panicles from late winter into spring. Very fine for accent planting in a protected spot.

Erica arborea alpina, another tree heather, known to grow to a height of 5 feet or more. Very hardy, flowering at the same time as the previous one, white in color.

Erica australis. Possibly the most outstanding of the tree heathers. A native of Spain and Portugal and known to reach a height of 10 feet or more. Flowers are of a bright dark rose and blooming during April and May. Somewhat tender.

Erica carnea, the winter heather. Of dwarf, compact habit, maximum height 12 inches, of a bright rose-purple and blooming from January to May. A native of the Alps and very hardy. Will grow satisfactorily even in soils having a mild alkaline reaction. Fine for mass planting in rockeries or clothing of banks or for foreground planting in front of conifers or rhododendron groupings.

Erica carnea var. 'King George.' A fine deep rose colored horticultural variety of the above. Commences blooming in December.

Erica carnea var. 'Springwood Pink.' A most satisfactory variety, very floriferous, bright pink. Commences blooming in February.

Erica carnea var. 'Springwood.' A very floriferous variety, strong vigorous grower, light green foliage. Flowers large, of purest white with brown anthers. Commences blooming in January.

Erica carnea var. 'Vivelli.' Of deep carmine red, with bronze foliage, commences blooming in January. Extremely fine but somewhat rare.

Erica ciliaris var. 'Mrs. C. H. Gill.' Probably the best of this type of a dark red.

Erica cinerea, Twisted Heather. A native of Southern England, quite hardy in the Northwest. One of the most valuable and showy of the summer flowering heaths, reaching a height of 18 inches, of brilliant reddish purple and blooming from August to October. Very useful for mass planting in rockeries and banks. This type is very drought resistant.

Erica cinerea var. *alba.* A pure white form of the above with light green foliage.

Erica cinerea var. 'Domino.' White with chocolate colored sepals. Dwarf grower, reaching a height of 10 inches.

Erica cinerea var. 'George Ford.' Slow growing, garnet colored and commences blooming in July, reaching a height of 10 inches.

Erica cinerea var. 'Golden Drop.' The dark green foliage is tipped yellow. Slow grower, starts blooming in July. Height, 10 inches.

Erica cinerea var. 'Turbua.' A dwarf grower of brilliant scarlet, commences blooming in July. Height, 6 inches.

Erica cinerea var. *atro-rubens.* Dwarf grower, reaching a height of 8 inches. Possibly the most conspicuous of the summer heathers. Of brilliant red. Commences blooming in July.

Erica darleyensis. Also known as *Erica Mediterranea hybrida.* Hybrids between *E. carnea* and *E. Mediterranea.* Of rosy lavender. Commences blooming in December. Height, 15 inches. Very fine for mass planting in rockeries or bank coverings.

Erica lusitanica, Spanish Heather. Quite rare and somewhat tender and requiring a well-protected spot. Fine for accent planting. Will grow to a height of 12 feet. Flowering from December to June, but at its best in March. White, highly fragrant.

Erica terminalis, the Corsican Heather. A native of Southern Europe. Very useful for

accent planting in the rockery or for foundation planting. Reaching a height of 4 to 5 feet. Rose-purple, and begins blooming in August.

Erica Tetralix, Mountain Bell Heather. A native of Europe. Very hardy. Fine for mass planting in rockeries or banks; of beautiful soft pink, commences to bloom in June. Distinct grey foliage. Height, 12 inches.

Erica Tetralix alba. A white form of the above with very stiff foliage, distinct. Commences to bloom in June. Height, 15 inches.

Erica Tetralix var. *mollis.* Flowers white, tinged pink, commences blooming in May. Height, 12 inches.

Erica vagans, Cornish Heather. A very free bloomer, lilac in color. Very fine for massing in rockeries and banks. Commences blooming in August. Height, 15 inches.

Erica vagans var. 'St. Keverne.' A very beautiful form of salmon pink, commences blooming in September. Height, 15 inches.

Erica vagans alba. A pure white form. Commences blooming in August. Height, 15 inches.

Erica 'Dawn.' Large flowers of soft pink, blooming commences in July and extends into November. Very fine for mass plantings in rockeries or banks. Height, 10 inches.

Erica var. 'Watsonii.' Very beautiful rusty red hybrid. Quite rare. Commences blooming in August. Height, 12 inches.

Erica Mackii. Dwarf grower. Very fine for foreground plantings of frosted pink. Commences blooming in July. Height, 8 inches.

Erica Williamsiana. A hybrid between *E. Tetralix* and *E. vagans.* Foliage very attractive bright green tipped yellow. Flowers pink, commences blooming in July. Height, 15 inches. Very fine for color accent planting.

Hardiest of all the heaths is the genus *Calluna vulgaris,* so hardy in fact that it can be grown as far north as the State of Maine. It is found naturalized in many areas of the Eastern United States, where it may have escaped from gardens.

Calluna vulgaris can readily be identified by the overlapping bracts of the foliage. There are many fine horticultural varieties, all suitable for mass planting in rockeries or on bank.

I have made the following notes on this genus:

Calluna vulgaris. The well-known purple Scotch heather. Commences blooming in July. Height, 18 inches.

Calluna vulgaris alba. The pure white form of the above. Very floriferous and showy. Height, 18 inches.

Calluna vulgaris aurea. Very attractive green foliage turning to bronzy brown in winter. Light purple and commences flowering in July. Height, 18 inches.

Calluna vulgaris var. 'Alporti.' A very striking variety of reddish purple. Commences blooming in July. Height, 18 inches.

Calluna vulgaris var. 'County Wicklow.' Very beautiful clear pink of dense flat habit. Begins blooming in July. Height, 12 inches.

Calluna vulgaris flore pleno. The double lavender form of *Calluna vulgaris.* Commences blooming in July. Height, 15 inches.

Calluna vulgaris var. 'Hammondi.' Of purest white. An improvement of *C. vulgaris alba* with large upright flower heads. Commences blooming in July. Height, 18 inches.

Calluna vulgaris var. 'H. E. Beale.' A most attractive hybrid. Long trusses of a clear silvery pink, double. Very vigorous and floriferous. Height, 24 inches. Commences blooming in August.

Calluna vulgaris var. 'Mrs. J. H. Hamilton.' A most distinct form. Its interlacing slender branches are roped with rose-pink double flowers. Dwarf, spready grower. Commences blooming in July. Height, 8 inches.

Calluna vulgaris 'Johnston's variety.' An outstanding type of Scotch heather of clean upright pyramidal growth with mauve colored blooms. Commences blooming in October. Height, 18 inches.

Calluna vulgaris 'minima.' Very dwarf. Foliage of dark mossy green. Pale lavender. Commences blooming in May. Height, 6 inches.

Calluna vulgaris 'Smith's minima.' An improvement of the above.

Calluna vulgaris nana. Very dwarf grower. Foliage compact of light green. Lavender blooms, commencing blooming in June. Height, 4 inches.

Calluna vulgaris var. 'pygmaea.' Dwarf grower. Foliage compact, of light green. Lavender flowers. Commences blooming in June. Height, 8 inches.

Calluna vulgaris 'variegata.' A very interesting form with golden flecked foliage. Flowers of lavender pink. Commences blooming in June. Height, 15 inches.

When we come to the fourth genus under discussion—the Daboecia, or Irish Bell Heather—we find a somewhat tender plant requiring winter protection and a very peaty soil condition. They are interesting for massing in rockeries.

Noteworthy varieties are:

Daboecia azorica. Of deep rose, commencing flowering in July. Low compact grower. Height, 10 inches.

Daboecia cantabrica. The St. Daboec's Heath. Flowers purple, commencing flowering in July. Height, 15 inches.

Daboecia cantabrica alba. A dwarf white form of the above, commences blooming in September. Height, 6 inches.

PAUL A. MAYER
(Spring 1947)

Care of Heather

All heathers present problems of the easiest culture. If the few rules mentioned below are followed, heather will thrive in our Pacific Northwest climate.

1. Plant heather in permanent spots in the garden or rockery in well-prepared soil. Heather loves a light sandy soil that is well enriched with cow manure, and to which a generous application of Canadian peat moss or well-pulverized lake bottom humus has been added.

2. All heather should receive a winter clean-up spray of an oil emulsion.

3. Before hot weather begins, mulch generously with Canadian peat moss.

4. Fertilize heather at least twice annually with an acid base fertilizer. Personally, I like to fertilize heather with cottonseed meal.

5. During hot, dry weather apply water in generous quantities.

6. Give such tender heathers as *Erica arborea, Erica australis, Erica lusitanica* and *Daboecia* a generous winter mulch of straw or conifer boughs.

PAUL A. MAYER
(Fall 1947)

We Are Loath to Change

In earlier days *Andromeda* was a very large genus and included genera now known as *Cassandra, Phyllodoce, Enkianthus, Cassiope, Zenobia, Pieris, Lyonia, Chamaedaphne, Oxydendrum, Leucothoe* and *Andromeda* itself.

Some of the genera are little known in cultivation in the Northwest but *Pieris* is, *Andromeda* is coming to be, and the others will soon be on the way for they are most useful in various garden ways—for foliage size, autumn color and so on.

In the genus *Pieris* there are about ten species—they are distributed in North America and Asia. They should all be valued in our gardens for their general floriferousness and most of them for their beautiful foliage. The one we know best is *Pieris japonica*. This beautiful shrub can grow quite beyond our expectations—it will in time achieve nine to ten feet. The leaves are leathery, glossy and toothed, about three inches long, tapering at both ends, and when young often show lovely colors ranging from saffron to coppery-rose or coppery-crimson. The flower trusses are made up on long pendulous racemes, the individual flower urn-shaped and waxy white. It is easily propagated by seeds and cuttings.

The genus *Andromeda* is quite different—none of the species exceeds twenty inches. Various species are found in North America, Asia and Europe aand all of them are good. The branches are wiry; the leaves are very narrow and the margins revolute. The foliage is more or less pewter-gray with pinkish tones and covered with a bloom. The bell-shaped flowers vary from pale pink to rosy-pink and

dangle from rosy stems. The plants prefer an acid soil and demand moisture in the growing season. They are easily struck from cuttings.

Why can't we learn to call "Pieris" by its rightful name and not by the name "Andromeda" which we all know belongs to an entirely different plant?

ELSE M. FRYE
(December 1944)

Arctostaphylos Manzanita for Dry Sites

THE use of native plant species for decorative purposes in the garden and around the home is too often shunned and avoided. Exotic types from far-off places seem to possess a lure which is not always justified if they are critically compared with species already at hand in nearby forest or field.

This seems to be true in the case of *Arctostaphylos columbiana,* a native which actually possesses features of beauty that are difficult to surpass. What more, beyond the following details, do you require of an ornamental?

Evergreen leaves, of medium size so that they do not detract from the garden scene as do such large-leaved species as the English Laurel, rounded, hairy leaves of a soft gray tone to neutralize garish colors elsewhere in the garden.

Flowers, elongated clusters of them in white or pinkish white, each one distinct and possessing the lovely urn-shaped form that characterizes so many of the closely-allied ericaceous plants such as pernettya and madrona.

Fruits, bright red-brown and berry-like, persisting into the winter. Bark, bright cinnamon-red bark, clothing artistically twisted and fluted trunks and stems. JOHN H. HANLEY
(October 1941)

Below:

Cassiope 'Muirhead'—a hybrid *Cassiope* between *C. Wardii* and *C. Lycopodioides,* one of many choice heathers growing in the upper lath house.

FIG. 7 PHOTO BY: WILLIAM ENG

Note on Kalmiopsis Leachiana

(Excerpt from a letter to Mr. E. L. Reber)

"WE too have had complaints regarding *Kalmiopsis Leachiana*. We have had our losses in growing them here, and all I can say is that they are like the little girl with her curls; when she was good, etc. Well, Kalmiopsis will grow like a weed, or it will not grow at all. I do know this much about it; it must have moisture at the roots during summer, although plants in the mountains seem to grow in soil almost dusty dry. But the stones, etc., around the roots keep them cool and moist. Then it must have perfect drainage, in summer as well as in winter. And while it grows in practically full sun in its native habitat, you must remember that the nights are always cool and foggy, with rains almost daily (very light showers, sometimes), and hence I think it should have a little light shade during the hottest part of the summer, as well as an occasional wetting of the foliage."

FRED BORSCH (Maplewood, Oregon)

(December 1944)

Gaultheria and Pernettya

THE words—coriaceous, leathery, shining, lacquered, lustrous, dark, evergreen, hard, glossy, strongly or deeply veined—when applied to foliage immediately conjures up in my mind something very beautiful. Then, whether the leaves are hung on a low or tall, spraddly or erect skeleton structure is immaterial, quite. I know I want it in my garden.

These descriptive terms apply exactly to the various species of *Gaultheria* and *Pernettya*. All of them have the little urceolate bells, usually white but often pink or pale peach and often glandular. They occur singly, in which case they may be larger, or in short or long racemes.

Those of us who like to grow rhododendrons may find the gaultheria and pernettyas to be splendid auxiliary plants. The tall rhododendrons are often inclined to be leggy. Their nakedness can be covered and the ground kept cool by having species from these genera growing among and under them.

Human kind seems to treasure most the plants from the far corners of the earth and pass by with utmost indifference the beauty easily within reach. I am thinking now particularly of our own *Gaultheria Shallon*. It is common throughout this Pacific Northwest region and will grow both in the open and in the dense shade of the Douglas fir forests. It will bend before constant wind but survives it. It was David Douglas, himself, who first brought it to England in 1826 and the English have learned to esteem its accommodating ways. The leaves are very dark green, sometimes four inches long and half as wide, heart-shaped at the base and tapering to a point. The pink glandular urn-shaped flowers are borne in racemes; the fruit is black. On the Olympic Peninsula coast it grows in thickets six feet tall or more but oftenest it is 30 inches or so. It is not easily transplanted from the wild but comes easily from seeds.

In this same region but well toward the summits, both east and west, we may find *Gaultheria ovatifolia,* a quite prostrate ground-covering shrub. When a pelt of it can be skinned off a rock, intermixed with *Cornus canadensis* and *Rubus pedatus,* and planted in the garden intact, we have something very special before which comments and criticisms fail.

On the east side of the summits and in the Rockies as well grows *G. humifusa*. The plant reaches to just a few inches, not more than four. The branches are erect, the leaves paler and thinner and smaller than those of *G. ovatifolia*. The fruits of both are red.

The genus was named after H. Gaulthier, a French naturalist and physician in the court of Quebec. The species of that region is *G. procumbens,* which extends as far south as Florida. Probably Dr. Gaulthier found the oil of wintergreen which the plant contains very useful in his simples.

From Asia we get some of the most spectacular plants of the genus. *G. Veitchiana* is

a low-spreading evergreen which widens continually by branches from the base. It is very free-blooming, the flowers being borne in narrow racemes and the fruit a bright indigo-blue in color.

G. Miqueliana is one of the best ground covers that I know. The leaves are especially attractive—oval, the netted veins very distinct, all dark green and leathery. The white fruits are said to be edible but who would be mean enough to devour even one!

G. Wardii is distinctive because of the burnished-gold down and bristles which cover the stems and young leaves. The fruits are blue and are covered with a blue bloom. This is not so hardy as some gaultherias.

G. nummulariodes is quite prostrate, rooting from the reddish branches which are beset with small heart-shaped leaves of coppery green, the whole clothed with reddish hairs. It would be most happy on a rotting log or stump; its ways are not unlike those of *Linnaea borealis*.

There are many gaultherias in Australia and New Zealand. *G. antipoda* is a wiry little shrub, the small oval leaves a lacquered brown-green. The flower clusters are erect and remain so in fruit which may be red or white.

G. hispida is one of the most handsome—erect, with narrow pointed leaves, conspicuously patterned by the veins. The fruit is white.

The genus *Pernettya* was named after Antoine Joseph Pernetty, who accompanied Bougainville on his famous voyage to South America. *Pernettya pumila* is the type species—I have yet to see that. *Pernettya mucronata*, also, is from the Straits of Magellan region. This plant is too well known to require any description or mention of its garden value. Many of the plants of *P. mucronata* are dioecious and to have abundant fruit it is necessary to have at least one staminate plant in the group.

Pernettya sp. Comber* is a comparatively late arrival discovered in the high Andes by Mr. H. F. Comber and introduced by him. It is a wonderful little bush for rock garden or ground cover purposes—not exceeding six inches and widening by stolons. All the branches are beset with small dark leaves with entire margins. The fruit varies in color—almost black, red, white and pink.

P. tasmanica forms a very low turf, not an inch high with tiny bright green leaves on which lie all winter bright fruits frosted white or cherry-red.

The reason I am writing about the two genera together is that in the wild they hybridize and give rise to some very beautiful compact free-blooming shrubs. They have been named *Gaulnettya*†—there are several of them:

Gaultheria antipoda x *Pernettya macrostigma*
Gaultheria depressa x *Pernettya macrostigma*
Gaultheria Colensoi x *Pernettya macrostigma*
Gaultheria rupestris var. *parvifolia* x *Pernettya nana*

At the Wisley Nurseries, England, our own *Gaultheria Shallon* has been hybridized with *Pernettya mucronata*. The resulting plant has been called *Gaulnettya*† *wisleyensis*.

Gaultherias and *Pernettyas* are often grown in shade which compensates for any lack of moisture. It is possible we could keep them more compact and force a greater production of fruit if we brought them into the sun. But, in such positions it is necessary to provide sufficient moisture and ample drainage.

ELSE M. FRYE
(September 1944)

**Pernettya leucocarpa*
†ED. NOTE. This bigeneric hybrid, now correctly called *Gaulthettya Wisleyensis*, originated as a natural hybrid in the Royal Horticultural Society's gardens at Wisley, England.

Results of Heather Growing Media Test

. . . it has been demonstrated that heather will respond well to soil mixtures containing liberal quantities of leaf mold and peat; that manure is definitely beneficial for good growth; and that a sphagnum and sand mixture has particular possibilities as a growing medium from either a practical or experimental standpoint.

DUANE O. CRUMMETT
(July 1941)

DAPHNE

Daphne and Its Culture

AMONG our low woody ornamentals the plants of the genus *Daphne* rank among the very best. Their foliage is handsome and their flowers are sweet scented, with a wide range of colors. They, as a rule, are early bloomers, some of them opening their fragrant flowers regularly in February in our climate.

Daphne Blagayana is a very low growing shrub suitable for use in the rockery or as a foreground for higher plants. The blossoms are creamy white, very fragrant and extremely persistent. The writer has had them in bloom from December until May. This variety is very partial to sunshine. It thrives in any well-drained soil, even stiff clay, but does best in a soil which contains a liberal amount of humus and sand. The humus should not be supplied by peat, but rather by decomposed maple leaves.

Another variety for which sunshine and good drainage is a must is *Daphne cneorum*. This plant, if well grown, is one of the most ornamental in our gardens. One strain producing pure white flowers, is rather delicate and hard to grow. Very few of the daphne group can stand bare root transplanting and all of them resent it very much.

Daphne collina comes to us from Italy, the island of Crete, and Asia Minor where it grows among the rocks and cliffs of the mountainous districts. The indigenous rock of its home is mostly a form of limestone which would make the soil more alkaline than acid. *Daphne collina* grows to a height of about three feet, and its foliage and twigs are similar to *D. cneorum*. In full sun, although it can stand partial shade, it blooms freely in early spring and, with us, again late in fall. The flower heads are similar to *D. cneorum* and the blossoms are rosy-purple and sweet scented.

Daphne odora has long been a favorite of our gardeners. It holds its foliage well during the winter and only in severe weather do the leaves show any sign of damage. Through correct and heavy pruning it can be made to produce sturdy, upright limbs and to attain a height of from three to four feet. In *Daphne odora rubra* the flowers are almost purple. *Daphne odora alba* is a variety that should not be overlooked.

Daphne laureola is an evergreen, upright bush, whose flowers are a greenish-yellow hue and faintly scented. The fruit, when ripe, is black and mildly poisonous. *Daphne caucausica* is a deciduous species as is *Daphne Mezereum*.

THEODORE ALBERT
(March 1942)

Daphnes in the Garden

DAPHNES are undoubtedly among the most beautiful of the low-growing shrubs. It must be admitted, however, that daphnes are in some respects contrary, evasive little plants. In some parts of the United States, daphnes refuse to live but they seem to favor the Puget Sound country. Fortunately the few species and varieties which are available to us come quite easily from cuttings so that the matter of keeping the garden supplied with them is not a difficult one. A very successful method of propagating *Daphne cneorum* and *Daphne Blagayana* is by layers. After the plants have flowered, spread out the growths in a circle and bury the stems with gritty soil. Rooted plants may be taken from the parent plant the following year.

Daphne 'Somerset' (*D. Burkwoodii* 'Somerset'), a creation of English hybridists, is recognized as a most valuable addition to the group. Its natural height is about three feet and it makes a spread equal to its height. The flowers, which are borne in May and June, are blush pink and delightfully fragrant.

Daphne arbuscula is a low grower seldom reaching a height of more than six inches. Its short branches of red-brown bear polished

green leaves and terminal heads of tubular, rose-pink flowers. They appear in spring and while similar to those of *Daphne cneorum* are somewhat deeper in color. The dwarf rhododendron, *R. radicans,* with its purple blossoms, and the early fall blooming heather, *Calluna vulgaris* 'J. H. Hamilton,' which is almost prostrate in its habits, are good companion plants for this little daphne.

Daphne petraea is another midget of the daphne group. Its average height is less than five inches. It has hard, dark, glossy leaves and bears an abundance of rose-pink flowers, one-third of an inch across. A variety known as *D. Petraea grandiflora* has larger flowers. This daphne blooms from June through August. It is seldom grown on its own roots, but is grafted on *Daphne Mezereum* or *Daphne laureola.* It is said to be a sun and lime lover.

Daphne collina, Daphne sericea and *Daphne retusa* are three other fine species. *Daphne laureola* is one daphne that is contented to live in the woodland or any other part of the garden where shade is prevalent throughout the day. It is known as the Spurge Laurel. When planted in shadowland, along with such plants as *Anemone japonica* and monkshood, it makes quite a nice showing.

Another daphne, still quite rare in American gardens, is *Daphne Dauphinii* supposed to be a hybrid of *Daphne odora* and *Daphne collina.* It has fragrant reddish-purple flowers which will sometimes put in an appearance as early as November and continue until early spring.

E. L. Reber

(Fall 1945)

HELLEBORUS

THE genus Helleborus is a very interesting one. *H. Niger altifolius,* or Christmas Rose, is the one that is best known and loved and is by far the most important. It has beautiful, pure white, anemone-shaped, five-petalled flowers, one to two inches across, with lovely yellow anthers. The blooms appear on fleshy stems about ten inches high, one or two flowers to the stem. The leaves are dark green and leathery, shaped very much like the foliage of some of the species peonies.

The plant is easy to handle. It likes a good rich soil that is well drained. The mature plants will stand dividing, but they suffer a good deal and are apt to sulk for quite a while.

Plants grown from seed are much to be preferred to divisions. They will grow and bloom in the same place indefinitely, the only care they need is a good dressing of well-rotted manure placed around them in early fall. Under no condition let it fall on the crown, for the buds are formed in the fall and are liable to rot. If the leaves show black spot at any time, cut them off and burn them.

Ingeborg Nevill

(March 1944)

More About Helleborus

WHAT a drab month January would be to garden lovers if we did not have the hellebores to cheer us and to make us believe that spring is already here.

Helleborus orientalis is our favorite. There is such variety in its shades of color, a variety that runs from deep purple, maroon, through rose and lavender to greenish-white. The flowers measure up to three inches across and have a wonderful variety of color patterns made by the speckles and tracings of mauve and chocolate.

H. orientalis is a very welcome flower to table decoration. It is most effective when floated in a low bowl or container so that its beautiful center is shown to best advantage. Also, by cutting it this way so many buds are saved. If it is cut with a long stem, the stems should be slit about an inch or so to facilitate the absorption of water. If the flowers begin to droop, they will freshen up again by being left in a cool, dark place or in a frigidaire for a couple of hours.

Helleborus foetidus is entirely different

from its relatives. The foliage is dark green and very palmate. It reminds one of the leaves of the umbrella plant. The buds begin to appear in December gradually unfolding into a large loose panicle of chartreuse balls edged faintly with red. The panicle spreads out until it often measures a foot and a half. About the latter part of May the top should be cut to the ground. The root system is very small making it unsafe to move any but young plants.

INGEBORG NEVILL
(Spring 1945)

CONIFERS

Western Red Cedar

IN a sense it can be said that this tree furnished the Indians with the three necessities of life—shelter, clothing and food. For their lodges were built of cedar plants; they used the inner bark of this species in the fabrication of wearing apparel; and their large and distinctive canoes, fashioned from huge cedar logs, enabled them to travel about on the bays, estuaries, rivers, and even the great Pacific in search of food.

One finds it a tree of singular beauty, especially when growing under natural conditions in the forest. Its crown, usually irregular, is characterized by long branches which sweep gracefully downward to slightly upturned ends.

The small, oblong cones are equally characteristic. Bright green in early summer, the cones take on a reddish to cinnamon-brown hue by fall.

C. FRANK BROCKMAN
(Fall 1952)

Diseases of Coniferous Trees

EVERY species of our coniferous trees is subject to attack by a number of different and important diseases. Since it is impossible to mention all of these, this article discusses four representative ones.

White pine blister rust, caused by *Cronartium ribicola,* has a complicated life cycle involving several spore forms on two entirely unrelated groups of hosts. *Ribes*—white pine. The two- and three-needle pines are not susceptible to white pine blister rust, although other rusts attack them. The only feasible means of controlling white pine blister rust is to eliminate the currants and gooseberries that serve as the alternate hosts for the fungus.

Pole blight of western white pine. In the early stages the most prominent symptom of pole blight is a yellowing of the foliage of an isolated tree or small group of trees in the stand.

A disease known as Berckman's blight of Oriental Arborvitae often caused serious damage in the Pacific Northwest. The disease appears as a blighting of the small branches which at first become light brown and then darker brown. To control this blight the trees should be sprayed with either cuprous oxide (one ounce to three gallons of water) or basic copper sulphate (2 ounces to three gallons of water). A single application ordinarily gives very good control.

Winter injury. An understanding of the causes of winter injury suggests various means of preventing it. These include: mulching to prevent freezing of the soil and shading or wrapping bushes and trees with burlap to reduce the drying effect of winds and bright sunlight.

CHARLES GARDNER SHAW
(Spring 1953)

Western Hemlock

IN a sense the western hemlock is the "Cinderella tree" of Pacific Northwest forests. Although interest in its utilitarian values was slow to develop, gardeners have recognized the beauty of this tree for a long time. During portions of the year the cones, nodding from the tips of the branches, are of equal interest.

Although the western hemlock is essentially a tree indigenous to the lower elevations in the Pacific Northwest, it has a relative—the mountain hemlock—which prefers the subalpine meadows and more rigorous regions at timberline.

C. Frank Brockman
(Spring 1954)

Native Trees of the Pacific Northwest

THE Douglas fir is an integral part of the forest scene throughout a wide area in the West—from British Columbia to the Sierra of Southern California, and in the Rocky Mountain region from Alberta to Southwestern Texas, and even in adjacent areas of Old Mexico.

But nowhere in this extensive territory does the Douglas fir attain the magnificent proportions found in the humid coastal forests of the Pacific Northwest between the Cascades and the sea.

C. Frank Brockman
(Spring 1952)

Western Larch

THE Western larch provides one of the most interesting arboreal accents to Northwestern forests. When the first hint of winter chills the autumn air, the larch—as if to celebrate the passing of summer—enlivens somber, coniferous-clad hillsides with vivid splashes of gold.

Although occasionally found in pure stands, the western larch generally grows with ponderosa pine, lodgepole pine, Douglas fir and lowland white fir. At higher levels it is often found with Engelmann spruce and even alpine fir *(Abies lasiocarpa)*.

C. Frank Brockman
(Winter 1954)

A Christmas Tree with a Future

TWENTY-ONE million conifers are cut each year as Christmas trees!

The tradition of the decorated Yule tree is deeply embedded in our culture and certainly none of us would want to see synthetic trees substituted for these members of the Pine Family. But would not a living tree symbolize the birth of the Christ Child with richer meaning?

Children seem to be especially intrigued with a tree that can go into the garden instead of the ashcan. The danger from fire is greatly lessened by the green foliage of a living tree.

Pat Ballard
(Fall 1954)

VINES

Clematis

IN the Puget Sound region the clematis blooming season starts in March with the creamy white *C. Armandii,* and may extend through most of October with some of the large-flowered *lanuginosa* types still in bloom.

These large-flowered hybrids attain various heights, the very shortest one I have grown is 'Prins Hendrik', only 26 inches over a two-year period. Among the very tall ones are 'Ville de Lyon', 'Perle d'Azue', 'William E. Gladstone', 'Fairy Queen' and 'Mr. G. J. Patjin'. These will run up from nine to twelve feet in a season. In colors the range is also wide.

There are many clematis native to our United States. In the eastern part of our own state we have *C. occidentalis* (syn. C. columbiana) a handsome blue one, and in the same

vicinity one known as 'Sugar Bowls' because of white encrustations. These are best raised from seed, plants being most difficult to establish.

Proper pruning makes stronger plants and avoids the development of a long, slender, naked, wiry stem. To understand the proper pruning of your clematis you must know the groups into which clematis fall.

By proper pruning one may have on the same plant low bloom and blooms on taller stems. If some of the old stems are cut to the last node above the ground and others cut three or four feet from the base, blossoms will form at various heights.

The culture of clematis is simple. Plant your clematis and never move them. Every February give them a light blanket of well-rotted cow manure. About June, lime the plants well. At all times keep the roots well shaded with some light growing herbaceous plant such as nepeta. All spring, summer and fall give them plenty of water—they are thirsty plants. Clematis like best to ramble in and out of other living shrubs—never expect them to enjoy a hot wall.

In mid-summer, sometimes the foliage is attacked by an invisible enemy, perhaps a fungus. The lowest leaves turn brown and crisp and this disease creeps right up the stem in just a few days, finally getting control of the whole plant. Spray instantly with a copper spray and spray every day or two until you have checked its spread. It seems to be fairly easily controlled.

BETH GILLEY MALMO

(Fall 1946)

Clematis

THE relative merits of the Clematis and the climbing rose have been discussed times without number. As a matter of fact, they may be used together to the mutual advantage of both.

Clematis should be planted so that the roots are protected from the direct rays of the sun. To achieve this, plant on the north side of the object which will give the vine its support.

One very good method of shading the roots is to place a large flat stone or concrete block in front of the base of the plant. Under this stone moisture gathers and is made available to the roots which delight in plenty of moisture during the growing season.

The distressing and heartbreaking disease is the Clematis wilt. First signs of this may show on any summer day when a beautiful plant begins to wilt at the top without any previous warning. By evening it is entirely flabby. In three days nothing is left but black brittle leaves and stems. To forestall such a disaster a good treatment for any Clematis is to soak the soil about the stem at ground level with a strong solution of Semesan, once on April 1st and again in mid-June. One such soaking is advisable whether your plant has ever been attacked by wilt or not.

BETH GILLEY MALMO

(Spring 1952)

Wisterias

GENERALLY speaking these favorite climbing plants are too well known to need much comment. The three species that conform to the usual idea of wisterias are *Wisteria floribunda, W. sinensis,* and *W. ventusa.* Of these, *W. sinensis* is best known, most widely planted. *W. floribunda* (Japanese Wisteria) is well distinguished by longer and more slender racemes. It is highly variable and has given many fine horticultural forms.

While wisterias are mainly grown as climbing vines they have a peculiar character that makes it possible to grow them in tree form.

The gardener is often saddened by the failure of wisteria to bloom. There are several possible reasons. First, it may be a seedling. The Chinese species, *sinensis* and *venusta,* are naturally very precocious and will usually bloom the first year after grafting, while the Japanese species and its varieties rarely are in that much of a hurry. If the vine is planned to cover a large area it is best to

(Continued on Page 117)

HOLLY

Holly Value Throughout the Year

HOLLY—if rightly used may bring interest and beauty to the garden throughout the entire year. With its masses of dense green throughout the year, the garden is never without life, particularly in winter. Hedges of holly are beautiful and most all of them can be used for this purpose.

Not all hollies are evergreen, and among the deciduous forms there are a number which are beautiful and most useful. They are generally used in tall shrub borders because they develop up to 15 feet high and wide. The red berries, well displayed on arching branches, are mostly retained long after the leaves have dropped, and sometimes remain until mid-winter.

Hollies enjoy sun, though they will tolerate partial shade. The soil should be loamy, well drained and cool. Compost of old oak leaves and well-rotted manure is an excellent refill when planting hollies and they respond with marvelous growth when old, rotted cow manure is fed them during the growing season. This can be applied on top of the surface as a mulch. They can be transplanted at most any time except when new growth is soft. One requirement is, make certain that all of the roots are retained, not cut off short in order to have a smaller ball of earth.

H. J. Hohman
(Summer 1949)

Hollies of the Southeastern States

HOLLIES native in the United States number nineteen species and a few botanical varieties and forms. All of them, except Alexander's *Ilex collina,* a deciduous sort, are native in the southeastern area. These include three evergreen species with black fruit, *Ilex coriacea, glabra* and *Krugiana;* five evergreen ones with red fruit, *Ilex Cassine, cumulicola, myrtifolia, opaca* and *vomitoria;* and eleven deciduous hollies that bear red fruits, *Ilex ambigua, Amelanchier, Beadlei, Buswellii, Curtissii, Cuthbertii, decidua, laevigata, longipes, monticola* and *verticillata.*

Most of the species listed have potential garden values. As a group native American hollies have been slighted in favor of exotics of other groups but now, in the eastern parts of the United States, *I. opaca* is receiving a large share of much merited attention.

H. Harold Hume
(Winter 1952)

Diseases of Holly in the Pacific Northwest

FORTUNATELY there are relatively few diseases of holly in this area. Canker disease of twigs and branches, leaf diseases, and more rarely a root rot disease have been observed. The stem canker diseases are the most destructive.

The *Boydia* canker disease does not appear to be a serious problem in holly plantings situated in a moderately open site where air movement is not too greatly restricted. Affected branches die back from the tip as a result of girdling action of the fungus farther along the twig or branch.

A second stem canker disease of holly, caused by *Phomopsis crustosa* develops as a bright brown surface spot which soon becomes dried and sunken. This disease has not caused conspicuous damage during the past four or five years.

A third type of canker may develop near the ground level on the main stem of young holly plants. Commonly these cankers result from heat injury to the bark on the south side of the exposed stem. Care should be taken to avoid exposing tender young plants to full heat of the sun.

A species of *Protococcus* (green alga) is frequently found in association with an unidentified imperfect fungus on holly leaf surfaces. This algal and fungal growth may be prevented by the use of a chemical spray and by pruning trees to allow good air circula-

tion. Growth of sooty molds may be prevented by keeping holly trees free of insects. Select a planting site that is sufficiently open to allow moderate movement of air through a planting. Prune trees sufficiently to allow air movement through the trees. Prune out and destroy all cankered and diseased twigs to remove a potential source of infection.

ROY A. YOUNG and I. W. DEEP
(Winter 1952)

A Holly Problem

THE holly is a comparatively slow-growing plant that under good cultural conditions will have a better root development than top. When this condition prevails, the plant has no occasion to bear. If the roots are carefully cut, the plant may be induced to berry the following season.

If root pruning can be done during a light rain or foggy period, the plant will be better able to tolerate it without wilting. Do not reduce the top by pruning if root pruning has been done since it would only serve to counteract the desired condition.

HARRY E. NELSON
(Winter 1952)

Hollies in the Arboretum

THE State Conservation Society in November, 1947, donated funds for the purpose of a collection of hollies in order to establish a holly grove in the Arboretum.

A group of five new beds was marked out and prepared during the winter of 1948 on a piece of ground immediately west of the Upper Road. In mid-March, 1949, twenty-nine species and varieties totaling one hundred thirteen plants, were set out. The arrangement was principally according to their botanical relationships. For the deciduous species of the subgenus *Prinos* an additional bed was made subsequently at the south end of the area. Between May, 1950, and April, 1952, some few additions have been made to the beds, so that there are now approximately twenty species assembled there, plus thirty varieties and five hybrids.

To summarize, we now have the nucleus of a good selection of hollies, most of which will be hardy here and the promise of greater variety to come during the next few years as our young plants develop.

B. O. MULLIGAN
(Winter 1952)

PROPAGATION

You Can Grow It from a Cutting

USUALLY cuttings are made of wood of the current year's growth four to six inches long. Many conifer cuttings can be made of shoots of two years' growth, an advantage in getting a sizeable plant. The more leaves that can be left on the cutting the better equipped it is for continued transpiration. In general the cutting should be taken from the sunny side of the plant. Since root-producing chemicals are situated in the apex of the bud and travel quickly to the cut end it is important to cut the shoots to size immediately.

Leaf-bud cuttings is a very economical way to utilize available wood, though it does add a year to the time involved in producing a blooming plant. Half-ripened wood should be chosen. One leaf with the bud in its axil and a small portion of the stem to insert in the cutting medium makes this kind of a cutting.

Root cuttings may be made of many things in fall and winter. Two to four-inch sections of the root may be buried in sand or open ground in trenches: *Paulownia, Romneya, Buddleia, Daphne, Cydonia, Rhus* and *Aralia* are only a few of the possibilities.

Shoots to be layered may be from two to fourteen inches long depending on the stature of the plant; the leaves of the portion to be buried should be removed; the stem should be twisted before bending upward and the bark scraped from the under surface. This is to arrest the natural flow of sap and

assist in the formation of roots at that point. Cover with peat or sand or garden loam. This process takes from one to two years.

Use flats of sharp, clean plaster for wooly-leaved, gray-leaved or hot country things. Flats of the same sand and peat in equal parts put through a quarter-inch screen may be used for ericaceous plants. Some commercial greenhouses use large quantities of vermiculite in their cutting benches; one-third peat, one-third sand, and one-third coarse vermiculite for ericaceous plants. Vermiculite by itself but less coarse for *Lithospermum, Daphne,* chrysanthemums and the like.

The rooting medium should be five to six inches deep. Temperatures of 55 to 70 degrees are average. In general shading hinders formation of roots but cuttings should not be allowed to wilt. A cold frame is better than planting cuttings in the open but for most things they are not a dead-end necessity.

I never refuse a cutting of some wished-for specimen. I try anything at the most inopportune times from the plant's viewpoint. And many times the most unlikely looking cuttings have rooted. When sufficient roots have formed the cuttings should be transplanted to good growing soil in flats, and after they have made appreciable growth they may be transplanted to beds.

It is great fun to make cuttings—a process I approach with a good deal of wonder, for then I am initiating a miracle, inducing roots and reproductive organs, a sort of continuous immortality, from a meager portion of a plant made up only of leaf and stem. In comparison, the rejuvenation of a lizard's tail seems simple. It is also an adventure—there is no telling—the veriest amateur may be the one to extend our knowledge of this craft which is still so limited.

ELSE M. FRYE
(Summer 1953)

(Ed. Note: See full text for cutting table arranged by months).

The Propagation of American and English Holly for the Amateur

CUTTINGS four to five inches long taken from the ends of the current year's growth give in general the best response. Those fully exposed to light are most desirable.

The upper three or four leaves should be left on the cuttings and the leaves should not be reduced in size. About one and a half to two inches of the lower part of the stems is made free of leaves by cutting, not tearing them off. The lower cut across the stem should be about a quarter inch below a node and must be made with a razor-sharp knife to insure a clean cut and not a bruised surface. The latter is slower to heal and rot may occur.

Late August and Early September is the best time to take holly cuttings. All that you need is an eight-inch deep box, with a length and width to suit your purpose, a pane of glass to cover it, some peat, some coarse sand and a little oak leafmold. Mix thoroughly three parts peat moss and one part of leafmold, place two inches of this mixture in the bottom of the box, moisten it well. Prepare a second layer by mixing one part peat moss with one part coarse sand and put in one inch of this mixture. For a third layer use one inch of coarse sand. Afterwards water carefully with a fine spray until the water shows on the top. A few hours later the cuttings can be placed.

Place the base of the cutting in a 1½-inch deep groove, set them in a severely slanting position so that the leaves almost rest on the sand, two inches apart in the row and about four inches apart between the rows. Firm each row gently with the finger tips. When all cuttings are placed, water thoroughly.

Location of the box: The north side of a building or the shade of tall trees or large shrubs. Put the glass cover on immediately after the final watering and do not ventilate the box. Watering may not be necessary for several weeks. Water only when moisture seems necessary. The cuttings are left in the box throughout the winter.

HENRY M. BIEKART
(Winter 1952)

Wisterias

WISTERIAS can be grown from seed or cuttings or by grafting. Seedlings will grow for many years without blooming. Cuttings are possible, not practical. Grafting is the certain way to get good plants that will soon start blooming.

WALTER B. CLARKE
(Summer 1949)

Those Perplexing Photinias

SEEDS should be collected as soon as ripe and stratified (mixed with sand and stored in a container out of doors) over the winter, then sown in flats or pots in February or March. Many people feel that photinias are difficult to transplant so it would probably be well to grow them in pots. They should be transplanted before the 15th of March.

PAT BALLARD
(Winter 1954)

Cypresses

PROPAGATION of Cypresses may be by seeds, cuttings, or grafting. Of these methods, propagation by seeds is relatively easy and the plants produced have been true to type. Seeds planted in flats in early fall give about a 15 percent germination in about one month, are ready to transplant in about 90 days and can be set out the following fall.

CARL B. WOLF
(Winter 1949)

The Beautiful Cornus Family

DOGWOODS are easily propagated by means of seed, by softwood and hardwood cuttings, by layering, and by grafting into seedlings of the type. Varieties like the pink flowered, double flowered and the weeping dogwood, can be produced by budding or grafting.

MRS. O. B. THORGRIMSON
(Fall 1949)

Recent Developments and Improvements in Cultivated Plants

ACCELERATION of seed germination has been one of the greatest aids to the plant breeder in his work. Hard coated seeds germinate more readily if scarified or pretreated with hot water or sulfuric acid before planting. The dormancy of some seeds may be broken by alternating temperatures. Refrigeration and controlled moisture hasten chemical changes required for germination in such seeds as delphinium, roses, pansies, parsley, lettuce and carrots.

Hormones have helped the breeder root more quickly cuttings of individual plants from which he needs to make clonal propagations.

CLYDE CHANDLER
(Fall 1949)

A Note on the Germination of Viburnum Seeds

VIBURNUM species, except southern forms, require a constant temperature of 20 degrees C. or a daily alternating temperature of 20 to 30 degrees C. for root production (germination) followed by a low temperature pretreatment for shoot production.

LELA V. BARTON
(Fall 1951)

Clematis

RAISING species clematis from seed is not any more difficult than raising primroses or other seeds which require patience. Other methods of propagation are by layering which takes a year but which is a sure method of obtaining new plants, the roots forming on each node, or by cuttings from half-ripened wood taken in July.

BETH GILLEY MALMO
(Fall 1946)

Davidia Involucrata

THE propagation of the tree has not been especially easy except from seed. Branches near enough to the ground root from layers quite readily but these are only produced from a tree which has been killed to the ground or deliberately cut down. By far the easiest and most successful method is from seed, planted as soon as ripe, in the late fall. Hard fleshy pulp should be removed before planting. Planted in flats or pots kept in a cool, light, airy pit house where the temperature ranges most of the time between 32 degrees and 42 degrees Fahrenheit. In spring they are removed to a shaded frame outside for the summer, returning them again to the pit in late fall. The following March or April, the majority of them will germinate. They should never be kept continuously in a warm greenhouse after planting nor should the soil be allowed to dry out at any time. As soon as they are three or four inches tall they should be potted and eventually lined out in a nursery row under a lath screen.

WILLIAM H. JUDD
(September 1944)

Summer Propagation

ANY terminal cutting of the current season's growth, regardless of length or maturity, would be a *new*-wood cutting and the maturity of the *new*-wood is of primary importance as applied to azaleas, camellias, and many other flowering shrubs. The degree of maturity will govern the percentage of success and also the length of time for rooting. Some shrubs are quite particular as to the degree of maturity, while propagating wood may be taken from others over a considerable period.

The rooting medium may be the same for all degrees of maturity of the cuttings, and for the majority of shrubs a mixture of two parts of water-washed sand and one part screened peat is satisfactory.

A well constructed cold-frame of standard size with plenty of drainage, possibly with insulated sides and sloping to the south or east, will be nearly ideal. This can be equipped with heating cables, under thermostatic control for bottom heat. It can be covered with sash to maintain moisture, or lath for shade, or both. In many instances cuttings can be left in this frame all winter. Sometimes it is more practical and economical to insert them in the recommended soil mixtures in flats or small boxes, these to be placed in the cold frames. In either case drainage under the frame is necessary.

Some prefer to place cuttings in regular flower pots then to plunge the pots in the frames so that they do not dry out so rapidly. Such a system is very satisfactory where only small lots of any particular variety are made.

If electric heating cables are used they should be covered over with ½ inch or more of sand before flats or pots are placed over them. If the propagating medium is to be used directly in the frame, it should be 3½ to 4 inches deep after tamping.

If, during the rooting period, there are indication of damping-off, mildew, or fungus, remove all affected cuttings and dust with a Bordeaux powder. Keeping the glass too tight on warm days may generate too much heat and a little ventilation may be necessary for a short period each day at the start. In this case watch the watering closely. Wetting down the medium with a solution of Semesan before the cuttings are inserted is a good precaution. If aphis appear spray with a good rotenone or nicotine solution. Reduce the strength from what you would use on growing plants.

PAUL D. BROWN
(Summer 1945)

TREES

Introduction of Chinese Ligneous Plants Into America

THE history of the introduction of ligneous plants into North America may be divided into three periods, the first of which embraces the time from the arrival of the first European settlers to the middle of the eighteenth century. Introduction of European trees and shrubs was restricted chiefly to fruit trees and other useful plants.

The second period is characterized by the introduction of an ever-increasing number of ornamental trees and shrubs exclusively from European gardens, and may be considered as extending from the middle of the eighteenth to the middle of the nineteenth century.

The first botanic garden in America was founded in 1801 under the name "Elgin Botanic Garden." The second edition of the catalogue of this garden issued in 1811, contained many European and a number of Asiatic trees and shrubs: *Gleditsia sinensis, Malus spectabilis, Magnolia liliflora,* the Pagoda Tree *Sophora japonica.*

A second botanic garden was established in Cambridge, Massachusetts in the year 1818 listing the following Asiatic trees, the Loquat *Eriobotrya japonica* and *Thuja orientalis,* the eastern Arbor-vitae.

The Arnold Arboretum was founded in 1872. All plants in cultivation in European and American gardens were collected and planted.

Professor L. J. G. Jack travelled to eastern Asia in 1905 and brought back many plants from Korea including *Quercus aliena* and *Salix Matsudana.* A year earlier the Japanese botanist, T. Uchiyama, sent seeds of Korean ligneous plants, among them: *Abies holophylla* the needle fir, and *Neillia Uekii.*

During the years 1907 and 1908 E. H. Wilson collected in China for the Arnold Arboretum. Wilson's new introductions, and even those of horticultural merit only, are too numerous to mention here, but the following selections may be noted: *Abies Fargesii, Aesculus Wilsonii, Cercis racemosa, Fagus lucida, Malus hupehensis, Populus lasiocarpa, Picea asperata, Salix magnifica, Stryax Wilsonii.*

In 1914 Wilson returned to eastern Asia, especially to Korea and Japan. Plants he introduced deserving special mention are: *Stewartia koreana, Thuja koraiensis.* In 1918, he introduced *Taiwania crytomeriodes,* the tallest conifer in Eastern Asia.

William Purdom visited the northern province of China in 1910 and 1911 and sent seeds of *Malus transitoria.* The largest collection on eastern Asia for the Arnold Arboretum to be mentioned here is J. F. Rock. Among the woody plants collected by him that were new to cultivation are: *Juniperus tibetica, J. distans, J. glaucescens, Betula japonica* var. *Rockii, Quercus laotungensis.*

ALFRED REHDER
(Winter 1951)

A Few Outstanding Chinese Plants

IT is autumn as I write and the age-old *Ginkgo* is clothed in its fan-shaped leaves now pure golden yellow in color. The Chinese pistache tree *(Pistacia chinensis),* however, is still green and verdant, leaving its sumac-like coloring for a later month. Color is coming slowly and less brilliantly for the large-leaves and tropical looking *Firmiana simplex* which is valued here more for its beautiful green bark that silvers over a little in the few specimens we have.

Acer Davidi, which apparently will remain a small tree, often with several trunks, shows its most striking beauty after the leaves fall to disclose the smooth green bark lined with silver.

Chinese *Cornus Kousa chinensis* make a superb counterpart to our native *C. florida* and repeats the picture at the time when our late mid-season azaleas are at their glorious best.

B. Y. MORRISON
(Winter 1951)

Some Chinese Plants in the Rochester Collections

EASILY mistaken for a clump of *Ailanthus,* our plants of *Cedrela sinensis* have in their flowering and their fruiting points of difference that make them well worth growing. Its large sprays of many white flowers are conspicuous in July, whereas the inch-long woody capsules that open up in the late fall to release the winged seed present one of the most interesting fruit patterns to be seen, five-parted open segments surrounding a five-sided cone of pith. It can not be expected to stand extreme winters.

Distinctive among the hackberries for its glossy leaves, *Celtis Bungeana* has grown into a wide-spreading tree and to a height of 25 feet. It bears nearly every year a sparse crop of the black-coated fruits but its primary value is in its foliage.

Rarely do we miss an opportunity to show our tree of *Eucommia ulmoides* for the interest everyone has in the demonstration of natural rubber fibres which appear as thin strands when a leaf is gently pulled apart.

BERNARD HARKNESS

(Winter 1951)

Autumn Color in Central Washington

AUTUMN is a beautiful season in Central Washington. The days are mild, the air hazy and dreamy. The fields and orchards luxuriate with colorful crops. The fiery hues of the sunsets are adopted by many trees and shrubs. The evergreens drip with morning dew. Their refreshed greens accent the rich autumnal colors about them.

The bush maples, *Acer ginnala* and our native *Acer glabrum* var. *Douglasii,* color brilliant reds and orange if the soil is drained well and not wet. *Cornus florida* colors regardless, bright reds and yellows, except the double and pink varieties, which tend to cling to rose, green and lavender shades to back their scarlet berries.

The autumn leaves of the pin, red, and scarlet oaks fade slowly from red to rosy tan, and sometimes cling all winter. White oak and beech leaves turn yellow and tan. They likewise cling to the twigs. Birch leaves drift down in early winter like yellowish green feathers, exposing the snow-white boughs. The odd leaves of the gingko lie like shavings of bright brass on the green lawn.

The over-sized soft maples are becoming red and yellow, while gold is just beginning to invade the dark green of the Norway maple. Yellow fronds and husks of black walnut and butternut lie in disarray about the blackish trunks, while some nuts still cling to the spreading, irregular branches. The guitar-shaped leaves of the tulip tree seem translucent, and shed golden light upon the grass. Lavender color adds relief to the bright red, gold, and green of the shiny, twisted, maple-like leaves of the sweetgum, whose fruits recall the corded balls which decorated velvet Victorian draperies. The sugar maples seem, at times, to generate light of their own, coloring to golden orange the air about their glorified tops.

Far up the dark somber wooded slope the blue grouse feed in the tall larch trees, as the slender golden needles float to the ground. The quivering leaves of the aspens are now bright yellow.

RAY L. GARDNER

(December 1943)

Eucalyptus for the Washington, Oregon, Vancouver Seaboard Region

THERE are several peculiarities of the genus which must be emphasized. All Eucalyptus species, with only three possible exceptions, will not tolerate wet soils; drainage must be perfect. Some shallow-rooted types may evade a water table a foot below the soil surface but for really satisfactory results use a deep, free-draining soil. Old moraine or talus are often ideal.

Growing conditions make a great difference to survival; sudden frosts after a period of quick growth often do great damage even to hardy species.

Do not be diffident about planting Euca-

lyptus in a poor, rocky soil; so long as it is deep and well drained its growth will surprise you. Moreover, don't hesitate to cut it back. In most Eucalyptus species the juvenile foliage is strikingly different to the adult form. It is usually the more attractive and most gardeners will try to maintain some of their trees in the juvenile state by heavy pruning. This may make them less hardy and also keeps the sensitive parts of the tree nearer the frost zone.

For convenience I have divided them into three groups:

(a) Those which have survived 0° F. There is only one species which falls in this category—*E. Gunnii.* It has proved the most consistently hardy.

(b) 5°-10° F. In this group is included *E. coccifera, E. niphophila, E. subcrenulata, E. vernicosa, E. parvifolia, E. urnigera* and *E. aggregata.*

(c) 10°-15° F. This group includes two very interesting ornamental types, *E. Perriniana* and *E. cordata,* and two forest giants, *E. gigantea* and *E. Dalrympleana,* and a savannah woodland tree, *E. pauciflora.*

This covers the species I feel would be most likely to be useful.

D. Martin
(Fall 1954)

Remarkable Garden Subjects

VISITORS to the writer's garden have, over a period of years, expressed admiring comments on certain of the trees and plants.

Styrax Obassia. A slender tree up to fifteen feet in height. Its large leaves are attractive and the six to nine-inch racemes of drooping white flowers resembling orange blossoms are borne in June and are quite fragrant.

Cercis Siliquastrum is a slender deciduous tree growing up to twenty-five feet in height. Its pea-like flowers freely produced are bright purplish rose It flowers in a leafless state and the profusion of bloom gives at a distance the effect of a rosy purple mist.

Donald G. Graham
(Spring 1949)

New Zealand Temperate Trees

WHILE New Zealand has, botanically speaking, a remarkable and unique flora, this flora has yielded few horticultural treasures to the world's gardens. Flowering plants are some 85% endemic and amongst them peculiarities have developed, such as a large collection of tree daisies, tree violets, one of the smallest conifers, forests of a sub-tropical structure growing in a temperate climate and other wonders of botany. Yet, with few exceptions, no trees or shrubs have spectacular flowers. They are mostly small, inconspicuous and as often as not whitish. All trees and shrubs are evergreen except some half dozen.

Our climate as a whole is not as severe as yours. The subjects mentioned, however, should succeed or should be worthy of a trial.

Our most common conifer, *Dacrydium cupressinum,* or rimu, belongs to an entirely southern hemisphere genus which is best developed in New Zealand. Although very slow growing, it has a handsome juvenile form with long drooping branchlets. It grows in the forests from one end of the country to the other, so it should be hardy in the climate of Washington.

A conifer which has North American affinities is *Libocedrus Bidwillii.* It has a graceful juvenile form and grows into a regular pyramidal shaped tree. As it grows in our mountains it is hardy.

Amongst our monocotyledonous plants we have a tufted tree belonging to the Agavaceae, *Cordyline australis,* or cabbage tree. Normally a swamp or wet ground tree, it has proved very adaptive in arboriculture, and is grown widely in many situations in New Zealand. If used discreetly its peculiar form adds variety to the tree and shrub planting. Periodically it has heavy flowering years when it produces an abundance of large panicles bearing small fragrant white flowers.

The most striking and most hardy is *Cor-*

dyline indivisa. It is a very handsome plant, seldom reaching a height of 25 feet, with massive heads of leaves, 4-6 inches broad. When it does flower it produces a massive panicle of blue berries.

Plagianthus betulinus, or ribbon-wood, should readily survive in the climate of Washington.

Hoheria Lyallii is one of the beautiful trees of the New Zealand flora, bearing in early summer a profusion of white flowers.

Nothofagus Menziesii, the silver beech, and *N. cliffortioides,* the mountain beech, withstand as rigorous conditions as any New Zealand trees. The northern rata, *Metrosideros robusta,* and the southern rata, *M. umbellifera,* will withstand cold conditions. Unfortunately, they do not produce their beautiful red flowers until they are fairly old.

A. L. Poole
(Spring 1949)

Maples of Japan

AUTUMN coloration fills a great role in the physiognomy of Japan. No one hesitates to recommend a maple as a star of autumn coloration. Above all the best are *Acer japonicum.* Thunb. and *A. nikoense* Maxim.

There are fundamentally 24 species, 4 varieties and tremendous numbers of so-called horticultural varieties or forms of maple described in Ohwi's *Flora of Japan.* Some of them change their color to red and others to yellow. (Ed. Note: See full text for informative list.)

Yoshiharu Matsumura
(Winter 1954)

An Upright Oregon Maple

THIS tree which was first noticed by the author growing at 18th Avenue and Madison Street, Seattle, in the winter of 1951, appears to be the first recorded example of a fastigiate form of the western species of *Acer macrophyllum.* 'Seattle Sentinel' has been chosen as indicating both the place of origin and the form of the tree, which is some 50 feet in height with a crown diameter of about 12 feet.

B. O. Mulligan
(Winter 1954)

California Oaks

CALIFORNIA is noted the world over for her magnificent forests of redwoods, and as the sole possessor of those immense trees, the giant Sequoias. Equally spectacular and far more romantic are her wonderful oaks.

In the early Spanish days, many a gay fiesta was held under the spreading branches of hoary monarchs, old even then, and the Franciscan fathers were said to have planted their missions only where the holly oak, *Quercus agrifolia,* flourished, for there the soil was good.

Oaks adapt themselves to their environment, both as to soil and climate. Thus while the only oak native to Washington, *Q. garryana,* is in our part of the state a rather scrubby tree, it is in reality second only to *Q. lobata,* the valley white oak, in size and beauty, in a more congenial climate.

The valley white oak is native to the broad flat valleys of California and is said to be the largest of all American oaks. It is certainly one of the most beautiful, with graceful drooping branches, as lovely in winter as in summer and it is mentioned by all the early explorers.

The evergreen oaks comprise a group of no less than seven members and with the exceptions of the valley oak are more spectacularly beautiful than the deciduous group. Chief among these evergreen oaks is *Q. agrifolia,* the California live oak.

These California oaks with their great ability for adjusting themselves to a varied habitat, can practically all be grown in our climate and the deciduous ones should be considered seriously as providing overhead shade for acid-loving plants.

Myrtle R. Thorgrimson
(September 1943)

Ornamental Native Woody Plants of Oregon

PERHAPS holding first rank in the affection of natives of the state is the somewhat unfortunately named Oregon Myrtle *(Umbellularia californica)*. In Southwestern Oregon, where it reaches its highest development, it adapts itself so readily to its immediate surroundings that it is characterized by two distinct forms. In close association with other vegetation, it tends to be tall and slender, but in the open, is conspicuously dense and as round-topped as though shaped by a gardener's shears.

HELEN M. GILKEY
(Fall 1950)

Eucryphias

I imported from England four varieties of Eucryphias. August flowering trees such as these would, I hoped, help achieve what many gardeners aspire to: a garden with succession of bloom using only trees and shrubs.

E. glutinosa is entirely hardy here. No other flowering tree or shrub in the garden can equal this in August. (fig. 8)

E. Rostrevor is a natural hybrid between *glutinosa* and *lucida*. When young, i.e., less than 8 feet tall, a severe winter will kill the top growth but usually it will grow again from the ground. Older trees apparently are entirely hardy.

E. Nymansensis, a hybrid *(E. cordifolia* x *E. glutinosa)* is a vigorous evergreen tree.

Eucryphias need a well-drained, peaty soil with old manure applied during the spring in alternate years as a top dressing. They strike easily from cuttings. I can recommend highly to all garden owners the three varieties described above.

DONALD G. GRAHAM
(Summer 1952)

Below:

Eucryphia glutinosa

FIG. 8 PHOTO BY: E. F. MARTEN

The Persimmon in the Pacific Northwest

THE persimmon has reached the peak of its usefulness and its glory in the Orient where it has been cultivated for several centuries. It has been called the apple of the Chinese. It is more than that; it is their vine and their fig tree.

The American persimmon *(Diospyros virginiana)* is probably the finest of our native fruits.

The American persimmon from the northern part of its natural range, can be grown anywhere in the State of Washington. The tree will stand the climate and will bear fruit abundantly. Staminate (male) trees must be planted with the pistillate (female) trees in order to provide pollination and fertilization.

The varieties of the Asiatic species *(Diospyros Kaki)* are the most important types and are the ones which we have been trying to acclimate and introduce to a skeptical American public. Persimmons blossom late, usually in June in this section. The fruit ripens late and is ready for picking in November after most other fruits are gone. We like to pick our persimmons after the first frost but before a heavy freeze.

The oriental persimmon had its origin rather well to the north in China and seems to stand a temperature of at least twenty below zero there. Tamopan, a form which is grown in the great orchards about Peiping, does well here in the Northwest. Another persimmon of promise is Honan Red which ripens among the earliest varieties.

CARROLL D. BUSH
(Fall 1945)

Many Little-Known Maples Ready for Extensive Use

SOME of the most beautiful and priceless gems of the tree family exist in the maple group.

First to be mentioned in this art gallery of tree treasures is the Purple Blow maple *(Acer truncatum)* — deep purple unfolding terminal foliage. Fall color is quite spectacular. Small, dainty, star-like leaves resemble a miniature Sweet Gum.

Sycamore maple *(A. Pseudo platanus)* varieties—*A. P. Spaethi*—burgundy wine-colored underneath part of leaf, *A. P. Worleei* new foliage unfolds in a burst of rich golden yellow.

Two small maples from Japan and China—Japanese striped-bark *(A. capillipes)* and David's striped-bark *(A. Davidi)*.

English hedge maple *(A. campestre)* has no spectacular features, but it has dignity and soundness.

Amur maple *(A. Ginnala)*—flaming red rugose-like leaves in fall make it worth a special effort to grow.

Trident maple *(A. Buergerianum)*—brilliant red fall color.

Cherry-bark maple *(A. griseum)*. Its smooth, bronzy cherry-like bark peels into thin coppery ribbons much like the paper birch.

EDWARD H. SCANLON
(Winter 1954)

A Canadian's Viewpoint on the Preparation for and Planting of Trees and Shrubs

THE failure of trees and shrubs to give satisfaction after planting in their permanent position, can in most cases be traced to the faulty preparation of the ground and wrong manner of planting. The proper time to prepare the ground for planting trees and shrubs is before the time of planting arrives. The nature of the soil should be studied for the requirements of the species of trees to be grown.

When digging holes to receive the roots, never dig cup-shaped but have the hole slightly larger at the bottom than the top and either level at the bottom or deeper around the edges. The shorter the time between digging plants up and resetting, the better it will be for the plants.

JACK RENTON
(Summer 1945)

The Beautiful Cornus Family

THERE is a member of this versatile family for almost any situation, as the genus includes plants ranging in size from the creeping bunchberry *(Cornus canadensis)* through shrubs and shrubby trees to our lovely *Cornus Nuttallii,* one of the two largest of the group.

Every season this *Cornus* family manages to put on an important show. Early spring is ushered in by the pale yellow clustered blossoms of the Cornelian cherry *C. Mas,* followed by the great white corymbs of *C. alternifolia* and by the white magnificence of *C. florida* and *C. Nuttallii* and in June by the most beautiful of all, *C. Kousa* and *C. Kousa chinensis.* In late summer and autumn, the leaves of almost all dogwoods assume brilliant autumnal colors with fruits varying in color; red, white, black, blue and one variety with yellow berries. All are hardy except *C. capitata* which is evergreen in our climate, dropping its leaves in early spring.

MRS. O. B. THORGRIMSON
(Fall 1949)

Getting Acquainted with Northwest Trees

IN this great Northwest the trees and forests are not among the least of Nature's handiwork. To be able to recognize the trees and know them by their correct names is the first step toward their appreciation.

It is possible to learn to recognize the different trees as seen from some considerable distance by means of the general shape of the crown, the way in which the branches come off, and the color.

HUGO WINKENWERDER
(June 1953)

The Cascara, a Northwest Tree

OUT of the fifty or more medicinal plants native to this state, probably no single one has attracted more attention from a commercial standpoint, than Cascara Sagrada *Rhamnus Purshiana.* It is a beautiful, symmetrical tree and is known to the Indians as the "Sacred Tree" or "Sacred Bark." The plant is native only to the Northwest, having for its boundaries Northern California, the Fraser River, the Cascade Range and the Pacific Ocean. The trees are comparatively free from disease. There is no lovelier tree grown in our gardens and our forests.

FOREST J. GOODRICH
(June 1943)

Trees for Town Gardens—Victoria

IF there is one point to be emphasized in this article it is the folly of planting a tree which will ultimately be too large for its intended position and then having to butcher it back regularly to keep it under control.

In the rose family are to be found most of the useful smaller types of ornamental deciduous trees—flowering cherries, flowering crabs, *Prunus Mume,* flowering plums. Valuable also are the hawthorns and these ornamental mountain ashes: *Sorbus discolor, S. Wilsoniana* and *S. Conradinae.* One should not forget the natives, flowering dogwood, vine maple.

W. H. WARREN
(Fall 1948)

Introduction of the Chestnut *(Castanea)* into Our Pacific Northwest

WE find chestnut plantings today fairly common, in northern Oregon and the Willamette Valley — about pioneer homesteads, in parks and along drives and country roads. If the American sweet chestnut is to survive as a species it will probably be in plantings on the Pacific Coast.

The Chinese chestnut varies considerably in native types and perhaps also in horticultural varieties The most suitable of these types for nut production in the home garden or landscape may be propagated by seedlings. They come into good bearing at eight or ten years of age.

THEO. H. SCHEFFER
(Spring 1951)

Fragrance in the Evening of the Year

IT is both easy and interesting to compile a list of flowers in bloom at Christmas time, but all too often, the names are just the poor ghosts of Summer and Autumn or else the tentative advances of Spring maidens, tempted by a mild spell of weather.

The honest fragrant flowers of Winter are headed by the exquisitely honey scented *Chimonanthus praecox,* with its waxy yellow, chocolate centered bells carried on leafless pale green branches during January and February. It blooms poorly unless sheltered from cutting winds and planted in light and well-drained soil in a place where it will be well baked by the summer sun.

The Witch-Hazels provide a Winter fragrance and display from November to February. Even after last winter's cold spell there is at least one Mimosa *(Acacia dealbata)* flourishing in Seattle on a sheltered south wall. The feathery, fern-like leaved tree will grow from 20 to 25 feet high and bears numerous spikes of small, delightfully scented, globular flowers from January to March. Remember that it *must* have a warm sheltered position.

One of the most rewarding of the flowering cherries is *Prunus subhirtella autumnalis,* delighting us as it does throughout the winter months from December to March, with its pale pink fragrant blossoms. BRYAN TAYLOR

(Fall 1949)

Some Ornamental Trees and Shrubs

ONE of the charms of gardening is the opportunity, in this favored region, to gratify one's own taste, both as to plants and the type of garden.

Zelkova crenata is a handsome, hardy, deciduous tree. It is slow-growing, long-lived, of extreme grace and its foliage is reminiscent of the daintiest of the bamboos.

Emmenopterys Henryi is a striking small tree. Its large leaves are very attractive. It is said to produce, in July, large white

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Autumn Harvest

MARGARET MCKENNY

A WALK in the woods in autumn is a revelation. After the fall rains the whole fungus world awakes. Beside the path, on every old tree trunk or crumbling log, mushrooms appear. At the signal of the rain they come forth in varied tints, rose, purple, golden yellow, a palette of color, but in muted tones like the subtle hues of a priceless Oriental rug. Their forms vary from the conventional umbrella-like cap and stem, to flower-like brackets, to branched delicate coral forms like the growths beneath the sea. Most of the mushrooms are not only beautiful but can furnish food of exciting flavor.

To satisfy the many who think of mushrooms as food only and to answer their query: "How can I tell a mushroom from a toadstool?", remember this—there is no difference except in nomenclature between the two. We may say an edible mushroom or an edible toadstool, or a poisonous mushroom or a poisonous toadstool. You must learn the difference in appearance just as we learn the difference between a carrot and a beet. Beauty has nothing to do with it. Some of the most beautiful mushrooms are poisonous and the little brown fellows at your feet may make a succulent dish.

Perhaps in late summer or fall you will take a trip to Mt. Rainier or into the deep rain forest of the Olympics. Suddenly not far from the road you will see a blaze of bright color on a fallen log. Jumping from the car you will find the log literally draped in shelf-like caps, glowing orange above and sulphur yellow beneath. The caps blaze as if with the garnered sunshine of the tree's centuries of growth. This chicken-of-the-woods, *Polyporus sulphureus,* is a worthy trophy for the pot-hunter as well as for the beauty-lover. The tender tips, floured and cooked in butter, with cream added, and with a little salt, freshly ground pepper and a touch of orégano, make a memorable dish in texture and flavor between breast of chicken and turkey.

As fall approaches, September rains bring to life the meadow mushroom, *Agaricus campestris*. In the open unploughed meadows, on golf courses, wide lawns and parking-strips, spring up the white caps. Remember, *always in the open*—this mushroom abhors the forest shades. The caps are usually white, silky-smooth above and are lined with rose or purple brown. There is magic in their quick appearance in these autumn days, half fog half sunshine, but underneath the close-knit turf, the true mushroom plant has been waiting. This underground portion is the mycelium or spawn, the real mushroom plant. What we gather is the flowering or the fruit.

If you have eaten only the mushrooms of the market or the can, you will be astonished at how superior in taste are these wild mushrooms. Cook them any way you would cook oysters. Cook books give a myriad of recipes, but the first time you prepare wild mushrooms, do so as simply as possible. Just wipe clean, (don't peel) cut up, flour lightly and sauté in butter, adding cream if desired, freshly ground pepper and a very little salt. That day you will become a mushroom connoisseur and will guard your sacred patch even from your dearest friends.

Perhaps as you stroll along some old logging road or where sawdust has been piled, you will catch a glimpse of tall white mushrooms—the shaggymane, *Coprinus comatus*. You will consult your book and find they are eminently edible. They may be in all stages of growth, but gather only the very young ones, for as they grow older these mushrooms dissolve into an inky mass. This is a process of self-digestion, so that the spores, the tiny bodies from which they reproduce, may be

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← The Panther Amanita
Amanita pantherina

FIG. 9 PHOTO BY: MARGARET MCKENNY

We are pleased to print this article by Miss McKenny whose book "The Zestful Wild Mushroom" is soon to be published by the University Press.

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To keep memberships in the Arboretum Foundation in good standing, dues should be paid during the month payable. Active memberships more than three months in arrears will be dropped and The Bulletin will be discontinued.

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All memberships are non-assessable.

Notes and Comment

Brian O. Mulligan, our peregrinating Director, has had a series of most enjoyable and profitable visits to botanic gardens, arboretums, private gardens, and nurseries in the United States, Canada, England, Scotland and Ireland, where he is collecting seeds, plants, ideas, and most important, contacts. To date he has been to some of the larger eastern Canadian gardens, the wonderful gardens of Scotland and Ireland and, of course, England, where he wrote that Bodnant, in Wales, was especially fine.

At this writing he is on the continent where he will visit nurseries and arboretums, some with which we have been exchanging seeds for many years, but have never had direct contact.

He will return to England for another round of garden visiting and then back to the United States and stops at some of the middle Atlantic seaboard arboretums. Already the fruits of these visits have been coming through the mail, in the form of seed packets and informational literature and we are in turn sending material from the Arboretum in exchange.

Although the Arboretum did not play a major role in the recent Fifth World Forestry Congress, its contributions were not insignificant. For instance, about some forty of the sixty-five trees planted in the International Peace Grove came from the Arboretum, as did much of the potted material used for decorating the stage at Meany Hall, and in various other exhibits. In addition, an open house on August 30th served to acquaint the delegates and their wives with the Japanese Garden and the Arboretum. Daily tours were conducted for those interested, and many delegates came over to wander about on their own.

Autumn Harvest

(Continued from Page 111)

released and fly to new habitations. Cook the young specimens immediately, frying them quickly in sizzling hot butter or olive oil. You will discover a new and most tantalizing flavor. By this time you will realize that every wild mushroom has a distinctive texture, aroma and flavor.

Now as fall really appears, look in the deep, mossy woods, especially in our National Parks where you need not fear hunters. Here you will find the mushroom with the singing name, Chantarelle, *Cantharellus cibarius*. Europeans prize this mushroom as one of the choicest. Growing in the loveliest situations, in wood-reveler moss or among the dainty twin-flowers, they look like golden yellow vases, ruffled and fluted, as intricately fashioned as any work of a mediaeval craftsman. And to add to their charm, they have the gift of fragrance—that of ripened apricots.

The Chantarelle was considered so choice in the past that the Romans cooked it themselves and served it on golden dishes. Now, chefs in million-dollar restaurants develop exotic recipes in which it is the main ingredient. And yet, in many of our forests, literally tons of these mushrooms go to waste just because we don't know our woodland treasures.

Chantarelles may be eaten raw or cooked. Wash, dry, cut up and marinate in French dressing, then serve with water cress or Romaine lettuce, or better yet, Witloof chicory. For breakfast or luncheon cut up, dry thoroughly, flour lightly, sauté in butter, add beaten eggs, salt, freshly ground pepper and a pinch of orégano. The orégano seems to enhance the woodland flavor.

Now you know well a few mushrooms which are truly good to eat. Fortunately the edible species far exceed the poisonous in number, but never-the-less, learn well the characteristics of the members of the Amanita group and let them severely alone. For your first excursion pick only the ones described and you will be perfectly safe.

The members of the Amanita (fig. 9) group may have red, brown, greenish, orange, tan or white caps. In the young underground stage the plants are enclosed in a wrapper, called a volva. As the young mushrooms push upward through the soil, this wrapper breaks, leaving half in the ground. This portion now is called the cup. The other half of the wrapper or volva is usually carried up on the cap in the form of warts or even large particles. The cup at the base, and particles of the wrapper on the cap are the two danger signals to beware of. Carefully avoid all mushrooms with these two warning signs. But remember never to experiment in eating other mushrooms. Mycology, or the study of mushrooms, is a branch of botany in which new discoveries are being made constantly. Leave experimenting to the scientists. It is truly dangerous.

Now, after a few excursions in our autumn woods and fields, you will be aware of their fascination. Once you have seen the wealth of color and form in this pageantry of the forest depths, you will feel that you have discovered a new realm of beauty.

Some Ornamental Trees and Shrubs

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flower bracts and big white flowers.

Stewartias, happy under rhododendron conditions, are hardy, deciduous, with large creamy, single rose-like flowers set off with yellow stamens. They bloom in mid-summer.

Another choice small tree is *Parrotia Jacquemontiana,* about 12 to 18 feet high and of spreading habit.

The *Liriodendron* is a handsome deciduous tree of pyramidal habit, when of sufficient size, produces greenish-white, tulip-like flowers in June and July.

Symplocos paniculata is a small tree with panicles of fragrant white flowers in May, followed by conspicuous brilliant blue, oval fruits.

D. G. Eggerman
(Fall 1946)

ARBORETUM NOTEBOOK

This section is particularly designed for notes, information and queries concerning beautiful or unusual plants from growers of all types or experience. We solicit your remarks and ideas, but space limitations may sometimes restrict us to publishing those of the widest interest.

CHOISYA

ONE of a short list of shrubs from Mexico is popularly called the Mexican Orange flower. The true Orange flower and Choisya belong to the same family Rutaceae, and the blooms resemble each other.

Choisya is a beautiful, fast-growing evergreen, aromatic shrub with bright green, lustrous leaves divided into three leaflets, slightly fragrant when crushed. In April and May it blooms profusely and frequently. There is a second bloom in August and September. It is said in a book on "Flowers from Mexico" that "it will bloom every two months if watered sparingly for a few weeks and then given water in liberal quantities." This method could be used to advantage when grown in tubs where the roots are restrained. If grown in a container it should be frequently pruned to keep the size proportioned to tub or plant container in which it is growing. The branches used in flower arrangements produce a pleasing effect.

Mr. Mulligan says he lost his Choisya in the hard freeze in 1955 but few were lost if planted against the house wall where they had slight protection.

In my own garden I grew it with *Escallonia macrantha* where the red blooms of Escallonia mingled with the white Choisya charmingly.

It grows in full sun in any well-drained soil.

COLCHICUM

EVERY fall there has long been an established path back of the Arboretum offices to see the Colchicum in bloom. Here is the main planting but many patches of them are found throughout the Arboretum, groups of chalice-shaped blooms mysteriously appearing from the bare ground, increasing in numbers each year. The exquisite colors are softly blended and some are charmingly checkered. Over a hundred Colchicums have been given separate names but of these only about twenty varieties are distinct species. One only, *C. cluteum,* blooms in spring. The name, Colchicum comes from Colchis in Asia Minor, there throughout the mountain area they were originally found. (The name Colchis is not found in the new atlases).

The plant develops from a sizeable, onion-shaped bulb which produces large, dark green bunches of leaves in spring. These leaves die down and disappear, leaving an area of bare soil. This habit is often a problem for the gardener who prefers the entire garden area to be a planted picture at all times. *Phlox drummondi,* pansies, dwarf petunias or low primulas and heathers will cover the ground satisfactorily before the Colchicum blooms come.

The bulbs should be planted in August at the latest in good garden soil fairly rich and moist. The bulbs and seeds of Colchicum contain a narcotico-acrid poison but no harm results when the bulbs are handled with ordinary care.

Colchicums are members of the great *Liliaceae* family and bloom in August and September when a conspicuous bloom is appreciated, opening without foliage. The bulbs remain for many years. When the leaves begin to deteriorate and fewer flowers are produced the bulbs should be lifted and divided. Bulbs may be grown from seeds.

There is one white variety with a large pure chalice that has no surpassing bloom at any season.

Colchicum is often called Meadow saffron or Autumn Crocus. They do well in partial shade but love best a sunny border.

G. T. D.

TUBEROUS BEGONIAS

THE begonia seed is so infinitesimally small that great care must be taken in its planting. Sow the seeds in shallow pans during January or February, using equal proportions of a compost of well-rotted loam and leaf mold, with sufficient sand to make a porous mixture.

Fill the seed pans with coarse material to insure good drainage, over this place the coarsest material from an equal proportion of a compost of well-rotted loam and leaf mold about one inch deep, finishing off the last one-quarter inch with finely sifted leaf mold, leveling and pressing slightly. Saturate thoroughly by standing the pans in water, drain, and broadcast the seed uniformly on the surface of the mixture. Cover the top with glass and heavily shade with paper, maintaining a temperature of 65° for quick germination. As germination takes place, remove the paper, lift the glass a wee bit, gradually removing same as growth occurs; then expose the seedlings to more light and air. When the plants are about one-half inch high they are ready to be transplanted about an inch apart. Lift them with a small V-shaped stick. When larger, transplant again, (as they grow vigorously) keeping them farther apart until strong enough to be potted.

Potting soil is absolutely important—a pile of sod mixed with barnyard manure, and permitted to decompose, makes a perfect compost. One portion of leaf mold to two of the compost, with sufficient sand for porosity, and a three-inch pot of fine bone meal. (Ed.—Probably per 2 cu. ft.) will develop strong, robust plants and flowers with a sheen, a gloss and a lustre that is indescribable.

W. L. FULMER
(June 1944)

In late February and early March an effective display of color can be had from a group of *Cornus mas,* the Cornelian cherry. Do not use the species for specimen purposes, however, unless you can provide a dark, evergreen background against which the light yellow flowers will show to best advantage.

(March 1944)

New or Unusual Plants in the Arboretum

In the winter of 1948-49 the Arboretum was able to import plants of two species of Sinojackia from a nursery in England—*S. Rehderiana* and *S. xylocarpa.*

The first flowering of both species occurred in May this year (1954).

It may also be worth mentioning that the Arboretum possesses a flourishing young specimen of the related tree *Rehderodendron, R. macrocarpum,* native of Mt. Omei in western China.

B. O. MULLIGAN
(Fall 1954)

A NEW type of tree which can be grown here is the heartnut *(Juglans Sieboldiana* var. *cordiformis).* The large palm-like leaves and the long clusters of fruits give a sub-tropical appearance to this interesting plant.

J. U. GELLATLY
(Fall 1945)

Skimmia Fortunei is a decorative shrub for foreground plantings and winter effects. It is not more than two feet high and pleasantly open. The leaves are smooth and dark green tapering at both ends. It is free-flowering, self-fertilizing, and produces an abundance of bright red fruit. Propagation from either seeds or cuttings is not difficult.

Skimmia Japonica is of less interest as to foliage. It grows to three or four feet and, I think, might make a handsome low hedge. The plant is not self-fertilizing and requires about one staminate plant to every six pistillate plants. Even so, a larger crop of berries follows if they are artificially fertilized. The fruit is exceedingly beautiful — large and waxed and bright crimson.

ELSE M. FRYE
(Spring 1945)

BOOK REVIEWS

Bonsai-Japanese Miniature Trees, Their Style, Cultivation and Training, by Kan Yashiroda (Charles T. Bramford Co., Newton Centre, Mass., 1960; price $5.75)

ALTHOUGH this book is interesting to those who already have bonsai collections and know something about their cultivation, I cannot recommend it as a good text for beginners. The truth is that it is a confusing book, more likely to discourage than to encourage the novice.

The author devotes a great deal of space to a discussion of the traditional methods of Japanese commercial bonsai growers and their, to us, unobtainable fertilizers and materials. This is of no value here.

However, there is a very detailed chapter on raising chrysanthemum cascade bonsai. This should prove helpful to anyone interested in these plants.

There are a number of good photographs of bonsai including some American species. This may be useful to those who want to enlarge their collections.

I feel, however, that there are other books much easier to follow in learning how to start this fascinating hobby.

MRS. H. RAPHAEL

Manual of Vascular Plants of the Lower Yangtze Valley, China, by Albert N. Steward, Oregon State College, 1958. Price $5.00—621 pages.

CHINA, mother of flowers, is exceptionally rich in plant-life and conversely, nearly as poor in modern scientific texts on her flora. The author of this manual, Dr. Steward, taught botany at the University of Nanking for nearly 30 years under the tremendous handicap of having no manual or handbook giving a key to or a description of the plants growing in the very populous lower Yangtze Valley. He was forced to use floras of eastern North America and of India for this area so it is no wonder that he devoted his energies to the preparation of this book.

His manual covers the eastern and central part of China and contains keys to and descriptions of nearly 2,000 species of vascular plants found growing there. The usual format for such manuals is followed, with keys to the families, genera, and species and a brief description of each species. Some indication of the plants' distribution and habitat is included, and at least one beautifully executed line-drawing is done for each genera of the higher plants, 510 pictures in all. The English common name is given when available as well as the Chinese characters for the plant, with an English translation. These latter names are often most charming—as for instance *Campsis grandiflora* which we know as Chinese trumpet vine, is called by the Chinese, 'Rising-cloud flower,' and the lovely *Enkianthus chinensis,* 'Heaven-full-of-stars.'

For one familiar with the somewhat more lengthy descriptions of plants found in local floras, such as the *Flora of Southeastern Washington and Adjacent Idaho,* by Harold St. John, or *A Manual of the Higher Plants of Oregon,* by Morton E. Peck, the specific descriptions of less than a sentence seem woefully short, but the beautiful illustrations help overcome this defect.

This is a very welcome addition to our library.

J.A.W.

The Soil and Its Fertility, by H. Teuscher and R. Alder with the collaboration of J. P. Seaton. Reinhold Publishing Company, 1960, 446 pps. $12.00.

THIS can best be described as both a general and a scientific treatment of the soil. The coverage is expansive with seven parts as follows:

PART 1. The Composition and Contents of Soils.
2. Physical Condition of the Soil.
3. Soil Dynamics—The Interacting Forces Within the Soil (the Living Soil).
4. The Main Nutrient Elements, Their Origin and Their Behavior in the Soil.
5. Manures, Composts, and Fertilizers.
6. The Laws of Soil Fertility.
7. Summary of Scientific and Practical Procedures.

The authors cover this broad range of subject material in 47 chapters and include a glossary of terms along with additional discussion and calculations of soil pH. Chapter coverage ranges anywhere from soil classification to plant analysis and soil management. With this broad type of treatment many soil principles are covered very lightly and details are lacking. There is also considerable intermixing of subject matter so that in some respects the book is difficult to read.

The authors have their own unique treatment of some subjects, particularly in relation to soil fertility. Although the book is written for the layman some of this material presupposes a rather detailed knowledge of soils in order to understand and evaluate the treatment but this detailed knowledge cannot be secured from the book. The subject coverage is complete though and includes such diverse topics as the downfall of ancient civilization as a result of soil mismanagement to current problems in waste disposal. The elemental composition of the soil and some of the important soil chemical processes are explained very well.

If the reader does know something about the soil or has a real interest in the subject this should be a fascinating book. It does focus attention on the medium plants grow in—the soil, and is full of practical information on plant-soil relationships, particularly relating to soil fertility and fertilizer practices. This book will give any serious reader a better understanding of the complex and dynamic nature of the soil and the fact that soil management is an important factor in plant production.

S. P. GESSEL

Wisterias

(Continued from Page 97)

forget about flowers and get all the needed growth as rapidly as possible. Then "reverse gears"—no fertilizer, minimum watering, and even maybe a little root pruning, all to slow down the growth. This procedure should soon result in bloom.

WALTER B. CLARKE
(Summer 1949)

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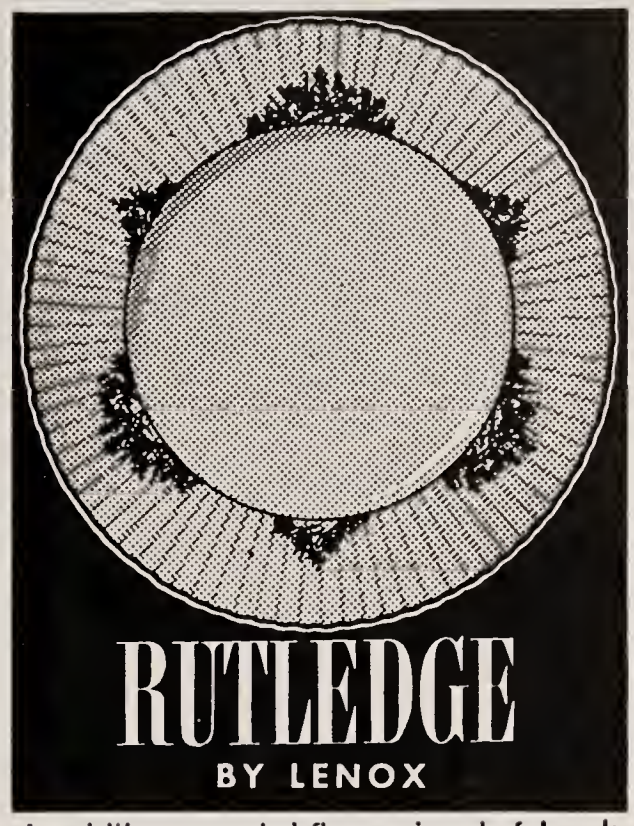

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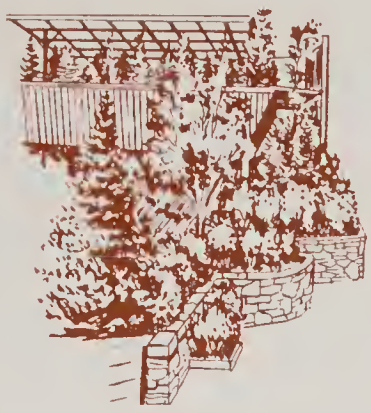

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